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FOUR NEW *SCOTINOMYS* FROM COSTA RICA

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In an effort to determine the geographical range of the little brown mice in Costa Rica I find it necessary to recognize two new species and two new subspecies. While large series of *Scotinomys* are now available from some localities, much of the intermediate territory and many regions are not represented, and the result of this study is not so conclusive as could be desired.

For the privilege of describing one of these species I wish to thank Mr. William P. Harris, Jr., whose generosity made available a valuable collection of Costa Rican mammals.

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Scotinomys teguina cacabatus, new subspecies

SAN CARLOS BROWN MOUSE

TYPE: A.M.N.H. No. 139733, adult female, teeth slightly worn, Lajas Villa Quesada, 5000 feet elevation,¹ 10 miles northwest of Volcan Poas, Province of Alajuela, Costa Rica; collector, C. F. Underwood, September 16, 1941. Besides the type there are nine topotypes and three specimens from Tapasco.

GENERAL CHARACTERS: Moderately large chestnut-colored *Scotinomys* of the *teguina* group with rather short close pelage, small ears, and relatively long tail; similar in general appearance and color to typical *teguina* from Coban, Guatemala, but larger in size, tail longer, and differing in some cranial characters.

DESCRIPTION: Color of type in unworn

pelage is about Mars Brown, shaded with black, grading to Prout's Brown on head and sides of body; the fur Dark Neutral Gray from base for most of its length, tipped with reddish Cinnamon-Brown and mixed with long black hairs; inside of ears sparsely covered with short Cinnamon-Brown hairs, outside of ears Blackish Brown; fore and hind feet and upperside of tail Blackish Brown, the epidermis on underside of tail dusky but the hairs are buffy; underparts of body thinly washed with Cinnamon-Buff. Skull large, with a slender, sharply tapered rostrum; nasals long, slender, emarginate, and conterminous with premaxillae posteriorly; braincase broad and relatively low; interparietal long anteroposteriorly and narrow transversely, the anterior border not extending clear across the posterior border of parietals; supraorbital ridges forming a small though distinct shelf over orbits and extending in a low ridge across parietals. Interorbital region depressed at posterior border of nasals, anterior palatine foramina long and narrow, reaching posteriorly to anterior border of first molars, palate reaching to posterior border of last molars; zygomatic arches slender; molariform teeth small but not peculiar; masseteric process of the zygomatic plate strongly developed, extending the palate well forward in front of the first molar.

MEASUREMENTS OF TYPE: The measurements of an adult female topotype are in parentheses. Total length, 145 mm. (145); tail vertebrae, 60 (56); hind foot, 19 (19); ear, 13 (13). Skull: greatest length, 23.75 (23.1); condylobasal length, 22 (21.2); palatal length, 11.1 (11); length of nasals, 9 (8.6); interorbital width, 4.3 (4.3); zygomatic width, 11.6 (12+); width of braincase, 10.5 (10.7); width of palate across

¹ Harris gives the elevation of Villa Quesada as 2200 feet. Underwood's collection came from the rocky ravines above the city.

m^2-m^2 , 5.4 (5.3); alveolar length of upper molar series, 3.8 (4).

Scotinomys t. cacabatus is readily distinguished from *S. t. irazu* by its larger size and noticeably darker and redder pelage, both above and below. The skull of *cacabatus* is also larger than that of *irazu*, with a broader, flatter braincase and a longer and more slender rostrum. It is more closely related to typical *teguina* but differs from the latter in its larger size, longer tail, somewhat richer shade in the color element, and larger skull with a longer and more sharply tapered rostrum. In typical *teguina* the interparietal extends in a narrow strip across posterior border of parietals, whereas in *cacabatus* it is triangular. *S. t. apricus* from Boquete is paler in color than *cacabatus*, and the skull and teeth are generally stronger with a heavier rostrum.

Some individuals in worn pelage are noticeably redder than the type, and the color of underparts is correspondingly darker and redder.

Scotinomys teguina escazuensis, new subspecies

ESCAZU BROWN MOUSE

TYPE: A.M.N.H. No. 138051; adult female, teeth worn; Los Higuerones, a caserio or community of small farms, 5000 feet elevation, in the humid tropical highlands above the town of Escazu, Costa Rica; collector, C. F. Underwood, November 1, 1940. Besides the type there are 68 topotypes, five from the town of Escazu; La Carpintera, four; El Copey de Dota, four; Estrella de Cartago, five; El Muñeco, one.

GENERAL CHARACTERS: A small, auburn *Scotinomys* of the *teguina* group; considerably smaller than *cacabatus* and with color element less intense; averaging smaller than *irazu*, with shorter and closer pelage and color shade cinnamon or reddish instead of buffy.

DESCRIPTION: General color of type in worn pelage: upperparts between Prout's Brown and Auburn, shaded with black. Tail dusky but, below, the hairs are buffy white for most of its length; fore and hind feet Blackish Brown; underparts thinly washed with Cinnamon-Buff. Specimens

in unworn pelage are heavily overlaid with black over rump and middorsal region. Skull small, with a small, smoothly rounded braincase and relatively short rostrum. Supraorbital shelves moderately developed and extending in a low ridge across parietals; masseteric process of zygomatic plate strongly developed.

MEASUREMENTS OF TYPE: The range of 16 topotypes is given in parentheses. Total length, 129 mm.; tail, in dry skin, 46; hind foot, 16, in dry skin, including claws, 17; ear, 12. Skull: greatest length, 21.6 (21.4-22.3); condylobasal length, 19.8; palatal length, 10.3; length of nasals, 7.3; interorbital width, 4; zygomatic width, 11.3; width of braincase, 10; width of palate across m^2-m^2 , 5; alveolar length of upper molar series, 3.75 (3.6-3.9).

Scotinomys t. escazuensis may be readily distinguished from *cacabatus* by its smaller size and less intense shade of red in the color element. The differences between *escazuensis* and *irazu* are not quite so apparent. Large individuals may equal *irazu* in actual measurements, but the longer and more buffy-colored pelage of *irazu* is at once apparent when actual specimens of both races are compared. *Scotinomys t. irazu* is really larger than is implied in Allen's description. The type is an exceptionally small individual, the choice of the only two specimens with complete skulls in the type series. The hind foot measurement of the type, 17 mm., was apparently taken without claws, as the entire foot in the dry skin is 18 mm. M. A. Carriker did not specify the elevation of the type locality, but 11 specimens, collected by Underwood in the cool dry region at an elevation of 9400 feet on Volcan Irazu, are typical. Two specimens from Cartago, 4800 feet, taken at the base of the Volcan Irazu, are considered by the author as referable to Allen's species, though not typical.

Scotinomys longipilosus, new species

IRAZU LONG-HAIRED BROWN MOUSE

TYPE: A.M.N.H. No. 141223, adult male; Volcan Irazu, Costa Rica, 9400 feet elevation; collector, C. F. Underwood,

August 22, 1941. Skin in good condition, skull complete except for basioccipital.

GENERAL CHARACTERS: A medium-sized, uniformly dark-colored *Scotinomys* with length of tail nearly equal to the combined length of head and body; pelage long, soft, and full, considerably longer on the head than height of the ears, in dried skin. Larger and darker in color than *Scotinomys irazu*. Similar to *Scotinomys xerampelinus* from Volcan Chiriquí but color darker and more tawny, tail longer, and skull more elongate.

DESCRIPTION: General color of upperparts nearly uniform Prout's Brown, darker on rump at base of tail, the fur Dark Neutral Gray from base for most of its length, tipped with Cinnamon-Brown and heavily mixed with long fine black guard hairs; color of underparts slightly paler than back and without the admixture of black guard hairs; fore and hind feet and tail Mummy Brown; ears blackish brown except for a few Cinnamon-Brown hairs on upper anterior border; hairs on lips and underside of mouth white. Skull long and slender, with a long narrow rostrum and slender nasals; braincase small, smooth, moderately inflated and constricted anteriorly; supraorbital ridges undeveloped; interorbital region narrow and inflated over orbits; zygomatic arches slender and not expanded, their sides parallel; interparietal narrow anteroposteriorly; anterior palatine foramina short and narrow, not quite reaching plane of anterior border of first molars; posterior border of palate squared and not drawn out into a median notch; bullae small but well inflated; nasals conterminous posteriorly with premaxillæ. Masseteric process of the zygomatic plate only slightly developed and the plate elevated in front of the first molar.

MEASUREMENTS: Total length, 151 mm.; tail vertebrae, 70; hind foot, 18 (dry, 18.5); ear, 13. Skull: greatest length, 22.3; length of nasals, 8.5; palatal length, 10.9; palatilar length, 9.8; mastoid width, 10.3; length of palatal slits, 3.3; zygomatic width, 11.2; greatest width of braincase, 10; interorbital width, 4.2; width across m^2-m^2 , 5; alveoli of upper molar series, 4.

Scotinomys longipilosus is a medium-

sized species with long soft fur, long tail, and needs no close comparison with races of the *teguina* group which have relatively close glossy pelage and a short tail. The underparts of *longipilosus* are only a shade lighter than its back; the color element being restricted and the hair long give a finely mixed cinnamon and dark gray effect. The skull is especially narrow in relation to its length, and the interorbital region is extended posteriorly, resulting in a small globular braincase and elimination of the supraorbital shelves. *S. longipilosus* resembles *xerampelinus* in the length of the pelage, but the element color is more cinnamon and the skull of the latter is broader and heavier with a much larger braincase.

The type of *longipilosus*, the only known specimen, was collected at a camp on the edge of the rain forest at an elevation of 9400 feet on Volcan Irazu. The dusky color and warm pelage of this species suggest a cool, moist habitat.

Scotinomys harrisi, new species

SAVANNA BROWN MOUSE

TYPE: U.M.M.Z. No. 62886, adult male, skin and skull, teeth unworn; Las Vueltas, Province of Cartago, Costa Rica; collected by Austin Smith, April 28, 1931. The type is the only known specimen and was taken on the savanna at an elevation of 8000 feet.

GENERAL CHARACTERS: A relatively large, buffy-colored *Scotinomys* of the *xerampelinus* group, with long, soft, full pelage and a comparatively short tail.

DESCRIPTION: Color of upperparts light Brussels Brown with little luster. The fur is Dark Neutral Gray from base for most of its length and broadly tipped with light Ochraceous-Tawny and sparsely mixed with long black hairs; cheeks and underparts clear Ochraceous-Buff; entire ear covered with fine Ochraceous-Tawny and black hairs, the light-colored hairs predominating. Feet, Mummy Brown but lightened by the presence of grayish brown hairs. The tail is exceptionally short and apparently complete. Skull large with a slender rostrum; nasals moderately long, narrow, tapered to a point posteriorly and extending slightly beyond the posterior

border of the premaxillae; braincase high and well inflated, supraorbital shelf and parietal ridges undeveloped, interparietal moderately long anteroposteriorly but not extending across parietals, bullae well inflated but not unusually large; molariform teeth large, the last upper molar with a small but distinct posterior cusp, toothrows slightly divergent anteriorly. Anterior palatine foramina reaching to a line across the front of first molariform teeth, and interpterygoid fossa extending to a line across the posterior border of last molars. Masseteric process of the zygomatic plate barely indicated, and the plate elevated at a sharp angle in front of the first molar.

MEASUREMENTS OF TYPE: For comparison, the measurements of the type of *xerampelinus*, an old male, are in parentheses. Total length, 141 mm. (145); head and body, 83 (80); tail, 58 (65); hind foot, 19 (17); ear from crown, 12 (from notch, 14). Skull: greatest length, 22.8 (22.6); basal length, 18.2 (19.2); palatal length, 10.9; palatilar length, 9.7 (9.6); length of nasals, 8.75 (8.6); zygomatic width, 11.6 (11.6); mastoid width, 10.3 (10.8); interorbital width, 4.5 (4.2); width of braincase, 11; width of palate across first molars, 5.05; length of upper molar series, 4.2 (4); length of mandible, 12.7 (13).

Scotinomys harrisi is larger than *S. longipilosus* with a shorter tail and color element buffy instead of cinnamon. In cranial characters it differs from *longipilosus* in

having a larger and broader skull, a noticeably larger braincase, larger teeth, and more divergent toothrow. Compared with *S. xerampelinus*, *harrisi* is larger with a shorter tail, and while the color element is of a similar shade it is much stronger, brighter, more uniform, and strongly accentuated over the ears, whereas in *xerampelinus* the ears are blackish. In cranial characters the skull of *harrisi* is similar to that of *xerampelinus* except that it has a more slender rostrum, higher braincase, slightly heavier teeth, and the last upper molar has a small but distinct subsidiary posterior cusp which probably disappears with wear. The two semi-adult topotypes of *xerampelinus* listed by Bangs do not have a similar cusp on this tooth.

The difference between *harrisi* and *xerampelinus* becomes more significant when the habitat and age of the two types are taken into consideration. The *harrisi* type is barely adult, with no signs of wear on the teeth, and was taken in savanna country at an elevation of 8000 feet. The *xerampelinus* type is an old male with much worn teeth and was taken on the desolate top of Volcan Chiriqui at an elevation of 10,800 feet in open rocky country, a little below timber line but where the forest had become stunted and sparse.

This species is named in honor of William P. Harris, Jr., whose scientific publications have added much to our knowledge of Central American mammals.